

REMARKS**Status of Claims**

Claims 3-8 are pending, of which claims 3 and 5 are independent. Claim 3 has been amended to correct informalities in claim language and to more clearly define the claimed subject matter. Claims 5-8 have been added. Support for the amendment is found, for example, at page 10, lines 14-21 and page 11, lines 4-16 of the present specification. Support for the new claims is found, for example, at page 9, lines 12-21, page 18, lines 19-22 and Fig. 2 of the present disclosure. Care has been taken to avoid the introduction of new matter. Favorable reconsideration of the application in light of the following comments is respectfully solicited.

Claim Rejection - 35 U.S.C. § 103

Claim 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatazaki et al. (US 2001/0038949) in view of Hosoya et al (US 2004/0076882). Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatazaki and Hosoya as applied to claim 3, and further in view of Yamashita et al. (US 6,387,564). Applicants respectfully traverse these rejections for at least the following reasons.

Regarding claim 3, the Examiner asserts that Hatazaki discloses Li_xCoO_2 and Li_xMnO_2 , where $0 \leq x \leq 1.2$, which overlaps the claimed range of 0.9-0.98. Further, the Examiner asserts that Hosoya discloses the amount of the second active material being in the range of 4-50%, which encompasses the claimed range of 5-20%. Applicants, however, respectfully submit that neither Hatazaki nor Hosoya discloses or suggests that the second active material has an average discharge voltage within 2V to 3V as recited by amended claim 3.

In Hosoya, a positive active material which is made by mixing two materials is used so as

to stabilize the crystal structure, thereby improving the charge-discharge cycle characteristics. More specifically, as disclosed in paragraph [0192] of Hosoya, the purpose of Hosoya is suppression of degradation of crystal structure of the whole cathode material in response to charge/discharge operations, because the second lithium-transition metal composite oxide exhibits a stable crystal structure. Therefore, Hosoya uses the first and second lithium-transition metal composite oxides, both of which are mainly composed of Nickel and act as 4V-class active materials. In other words, the average discharge voltage of the first and second lithium-transition metal composite oxides of Hosoya is about 4V. Hosoya uses a positive active material prepared by mixing materials of which stabilities of crystal structure are different from the claimed material, and the average discharge voltage of Hosoya's second active materials is about 4V.

In addition, Hosoya discloses the use of a mixed positive active material of first and second lithium-transition metal composite oxides, of which the average discharge voltage is lower than that of the first lithium-transition metal composite oxide when discharged from 4.25V to 3.00V (see, claims 14 and 15 of Hosoya). The effect thereof is to lower the potential of the cathode (positive electrode) at the end of discharge, thereby suppressing the potential rise of the anode (negative electrode) so as to improve the over-discharge resistance (see, paragraphs [0119] and [0120] of Hosoya). Although Hosoya discloses that the voltage difference is 0.05V or more, the average discharge voltages of the second lithium-transition metal composite oxides shown in Table 6 exceed 3.8V. This means that the second lithium-transition metal composite oxides of Hosoya are 4V-class active materials. This is further evidenced by the fact that the purpose of Hosoya is to lower the potential of the cathode (positive electrode) at the end of discharge, not to suppress the current-increment around the end of discharge.

In contrast, in the claimed subject matter, the average discharge voltage of the second

active material, i.e., LiMnO_2 , is within 2V to 3V. Thereby, the current increment around the end of discharge near the discharge-end voltage within 2.5V to 3.0V can be suppressed. As a result, the heating of the battery can be prevented. In other words, the present subject matter can prevent the heat from being generated at the end of discharge by mixing a 4V-class active material with a 2-3V-class active material, i.e., LiMnO_2 .

As such, it is clear that the composition of the alleged second active material of Hosoya is different from the claimed second active material. Further, it would not have been obvious to add this feature to the combination of Hatazaki and Hosoya. Accordingly, claim 3 and claim 4 dependent thereon are patentable over the cited references. Thus, it is requested that the Examiner withdraw the rejections of claims 3 and 4.

New Claims

Applicants respectfully submit that none of the cited references discloses that a discharge curve has a plurality of step-like inflection points, as recited by new claim 5. Accordingly, claim 5 and all claims dependent thereon are patentable over the cited references.

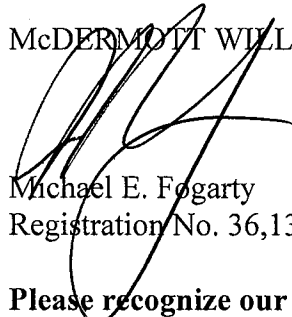
Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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